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ACCESS TO PRENATAL CARE IN NORTH CAROLINA: A COMPARATIVE STUDY OF WOMEN WITH SOME PRENATAL CARE AND WOMEN WITH NO PRENATAL CARE

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ABSTRACT

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During the decade of the eighties the overall number and percent of babies born in North Carolina to women with no prenatal care has increased dramatically. This paper examines the contributions of attitudinal, and sociodemographic factors in distinguishing between women with no prenatal care and women with some prenatal care but less than adequate care from the 1985 North Carolina birth cohort.

Using a multivariate logistic regression model the sociodemographic factors that were found to be important predictors of prenatal care include marital status, with married women more likely than unmarried mothers to have received some prenatal care; employment, as women working at full-time jobs more likely than others to have received care; parity, with first-time mothers more likely than multiparous women to have received care; and income, with wealthier mothers more likely to have received care.

Factors associated with the health care system were also important predictors of prenatal care. Women who received their primary health care from a private physician, or health department were more likely than those who did not have a regular source of care to receive some prenatal care. The means through which a woman determines the existence of her pregnancy is also an important predictor of care. Women who found out for sure they were pregnant from a private physician or local health department were more likely to have received care than those who found out about their pregnancy from another source.

The best predictor of prenatal care in the multivariate models was participation in the Women, Infants and Children (WIC) Program. Whether WIC participation leads women into care or prenatal care is the means through which women enter WIC cannot be determined from the data.

INTRODUCTION

The contribution of comprehensive prenatal care to the reduction of maternal and fetal morbidity has been recognized in numerous research studies conducted during the past thirty years (Eastman, 1947; Gortmaker, 1979; Greenberg, 1983; Schwartz, 1962). As early as 1947, Eastman presented data indicating that women who received no prenatal care at the Johns Hopkins Hospital were three times more likely to deliver prematurely than those with three or more prenatal visits. While research findings have not been unanimous in support of this association, a significant body of research evidence indicates that women who obtain adequate prenatal care have larger babies than women who do not obtain such care. These babies are larger due to both a prolongation of gestation and an improved weight for gestation. This association remains after controls are provided for race and education.

Ensuring access to prenatal care services became a public health policy initiative nationally with the 1980 publication of *Objectives for the Nation* in which the objective was stated, "By 1990, the proportion of women in any county or racial or ethnic groups who obtain no prenatal care during the first trimester of pregnancy should not exceed 10 percent." (Public Health Service, 1980). Further, the National Association for Public Health Policy's Council on Maternal and Child Health (1986) has recently advocated the provision of maternity care to all pregnant women. While this is not a new public health goal, the provision of universal prenatal care may be further from reality today than in the past.

Data from numerous sources indicates that timely access to prenatal care has eroded in recent years. The National Center for Health Statistics Advance Report (1981) first noted a discontinuation in the long-standing trend of improvement in prenatal care statistics for the nation. These findings have been confirmed by surveys in Lexington/Fayette County, Kentucky (Kentucky Coalition for Maternal and Child Health, 1983), Oregon (Oregon State Health Division, 1983), and by more recent national data from the National Center for Health Statistics (1982) that indicated an increase in the proportion of black and white women receiving no prenatal care between 1981 and 1982.

North Carolina vital statistics during this period have mirrored other state and national data. During the period 1975-1980 the proportion of nonwhite infants born to North Carolina women who started prenatal care in the first trimester of pregnancy

increased steadily by an average of 4.1 percent annually. The proportion of white infants born to women with first trimester care increased by an average of 5.1 percent annually. During the 1980-85 period the rate of improvement in timely prenatal care dropped precipitously by 1.5 percent and .4 percent annually for nonwhite and white infants respectively.

The percentage of nonwhite and white infants born to North Carolina mothers who had no prenatal care fluctuated over the 1975-1980 period. Table 1 indicates that the percent of all infants born to women with no prenatal care in 1975 was almost identical to the percentage in 1980. Beginning in 1981 a trend towards decreasing prenatal care utilization is evidenced in both white and nonwhite births. The percentage of white births born to women with no prenatal care increased by 29 percent between 1980 and 1985. The greatest single year increase for white births with no prenatal care was 10 percent between 1984 and 1985. The percentage of nonwhite births born to women with no prenatal care also showed a similar pattern with an increase of 42 percent between 1980 and 1985. Between 1984 and 1985 the percentage of nonwhite infants born to women with no care increased by 21 percent.

TABLE 1
PERCENTAGE OF BIRTHS TO WOMEN
WITH NO PRENATAL CARE
1975-1985

| Year | Race | | |
|------|-------|----------|-------|
| | White | Nonwhite | Total |
| 1975 | 0.47 | 1.76 | 0.88 |
| 1976 | 0.54 | 1.71 | 0.91 |
| 1977 | 0.47 | 1.71 | 0.87 |
| 1978 | 0.53 | 1.68 | 0.90 |
| 1979 | 0.54 | 1.78 | 0.94 |
| 1980 | 0.52 | 1.69 | 0.89 |
| 1981 | 0.54 | 1.76 | 0.93 |
| 1982 | 0.57 | 1.78 | 0.96 |
| 1983 | 0.57 | 2.04 | 1.03 |
| 1984 | 0.61 | 1.98 | 1.03 |
| 1985 | 0.67 | 2.40 | 1.21 |

This alarming erosion of timely access to prenatal care in the state led to the initiation of the 1985 Access to Prenatal Care Study (APCS), a statewide survey of beliefs and conditions considered important in explaining access to prenatal care services by low-income North Carolina women.

DATA AND METHODS

The Access to Prenatal Care Survey (APCS) was a statewide frequency-matched design in which infants whose mother had no prenatal care, identified from their 1985 birth certificates, were matched to women with less than adequate prenatal care based upon the Kessner Index of prenatal care. The Kessner Index categorizes infants on the basis of the timing and frequency of prenatal care and gestational age of the infant at birth. Frequency of visits is classified by the American College of Obstetrics and Gynecology standard schedule of visits. These categories are Inadequate care, Intermediate care, and Adequate care. Women with adequate prenatal care must have initiated care in their first trimester and received a sufficient number of visits for the gestational age of their infants. Women receiving less-than-adequate care would have begun their care after the first trimester or received less than the standard number of visits for gestational age of their infants.

The choice of less-than-adequate care as the standard of comparison was based upon both practical and empirical criteria. While the ideal of public health is to ensure access to adequate prenatal care for all women, an interim step is to reduce the number of women who receive no prenatal care. In the short run a more realistic goal is to push this group of women into the some-care category. Empirical data also support the importance of some care on outcome variables such as birthweight and prematurity. Ryan et al. (1980) showed that the greatest improvements in newborn health are between those infants with no care and those with some care.

No-care infants were frequency matched to some-care infants on the basis of four match variables: mother's age, in 5-year age groups starting with 10-14 and ending with 30 and over; mother's education, in categories less than high school, high school, and greater than high school; race, with white and nonwhite groups; and region of the state, using the four Department of Human Resources regions.

Frequency matching sets sample size criteria within each category of the match variables. The goal of frequency matching is to set the percentage distribution of the some-care women to that of the no-care women within each cell of the $5 \times 3 \times 2 \times 4$ matrix of match variables. In other words, the sample of some-care women chosen resembled, with respect to sociodemographic and geographic criteria, the no-care women.

A sample of 1,200 1985 birth certificates was chosen; 600 some-care births and 600 no-care births from the automated birth registry file maintained by the State Center for Health Statistics. Lists composed of mother's name, child's name, father's name, and address were compiled by county of residence of the mother. Interviewers assigned by each county health department participating in the APCS were trained in data collection techniques and provided with lists of interviewees.

Data collection began in April, 1986 and was completed in early July. A total of 709 completed interviews were collected from the 1,200 respondents initially selected for the study. Based upon comparisons of 354 no-care respondents and 355 care respondents interviewed, no discernible response biases were found, with the age-race-education characteristics of the entire sample not significantly different from that of the actual respondents. Comparisons did, however, reveal discrepancies between birth certificate entries of no prenatal care and self-report of respondents of their prenatal care. The original file of 709 was reduced by 146 respondents with discrepancies in care status. This report is limited to these 563 observations.

The primary methodological tool used here to distinguish between no-care women and some-care women after controlling for sociodemographic and geographic confounders was logistic regression for the analysis of categorical dependent variables. Each logistic regression model must include match variables as predictors as well as other variables of interest. Logistic regression provides a determination of the effect of predictor variables such as marital status, employment, income, and attitudes related to primary care on the odds of receiving some prenatal care. Effect parameters take the form of integers between 0 and infinity with numbers less than 1 indicating a reduction in the odds of receiving care and numbers greater than 1 indicating an increase in the chances of having some prenatal care.

THE PROCESS OF SEEKING PRENATAL CARE

The decision to use prenatal care services is a complex interplay of attitudinal factors prevalent at the time of pregnancy and biological conditions that change with gestation, worked out within the context of the family, the broader social group, and what Levine et al. (1969) describe as the culture of medicine, the health care delivery system. Prenatal

care is commonly considered an aspect of preventive medicine as are blood pressure screening, pediatric immunizations, pap and breast examinations, etc. Health care utilization for preventive and curative purposes has been the subject of extensive investigation by health care researchers and this literature will provide a useful theoretical and organizational context for the analysis of prenatal care.

A conceptual framework developed by Aday and Andersen (1975) considers health care utilization the result of predisposing, enabling, and need (illness or symptoms) variables.

Adapted to the investigation of prenatal care, the **predisposing component** refers to the attitudinal, experiential, and sociodemographic precursors to pregnancy that provide the context in which the decision to seek prenatal care is formulated.

Beliefs and attitudes have been shown to exert considerable influence upon the utilization of preventive and curative care. Rundall and Wheeler (1979) investigated the role of beliefs and attitudes, financial constraints, and the bureaucratic organization of welfare medicine in explaining the positive association between income and use of preventive services. They found that poor respondents were more likely to consider themselves less susceptible to illness than those with higher incomes. The financial constraint hypothesis was not supported by the data.

Crandall and Duncan (1981) also present data that highlights the importance of beliefs and attitudes on the use of discretionary health care. They found that a more positive belief in the effectiveness of medical care, especially by low-income people, increased their use of preventive care.

The sociodemographic correlates of the utilization of prenatal care have been presented by the National Center for Health Statistics (1978) using 1969-1975 data. Those most at risk of receiving no prenatal care are young, nonwhite, unmarried, primiparous women with less than high school education.

The **enabling component** of Aday and Andersen (1975) consists of family resources such as income, health insurance coverage, the existence of a regular source of care, and means of transportation.

The relationship between income and use of health services has been the subject of considerable research for several decades. The seminal study in the area was Koos' (1954) *The Health of Regionville*

in which community members were categorized by social class. Koos found that members of lower social classes, when compared with higher income groups, were less likely to define 17 physiological symptoms ranging from loss of appetite to lump in abdomen as necessitating medical care. Prior to 1970 the Regionville experiment was cited as the basis of the differential in the use of health care services by the poor. National data gathered in 1960 and 1965 supported the study by establishing that a positive association existed between income and health care utilization.

Beginning in 1968, the National Center for Health Statistics presented data indicating that middle-income individuals were less likely than the low-income group to use health care services. Medicaid and Medicare benefits were the probable cause of this pattern reversal. This shift in the overall pattern of health care utilization has not, however, been observed in preventive health care utilization prompting Rundall and Wheeler (1979:397) to comment "...one of the most persistent income-related inequities [in the United States] is in the use of preventive health care services."

The most systematic investigation of the association between income and health care utilization was undertaken by Dutton (1978) in which three alternative explanations were evaluated: (1) the culture of poverty, (2) financial constraint, and (3) system barriers to health care utilization.

The culture of poverty explanation was originally proposed by Lewis (1966) in a series of studies conducted in low-income urban areas of Mexico and Puerto Rico. He argued that the poor adapted to persistent and pervasive economic deprivation through developing strategies that, over several generations, became deeply ingrained attitudinal, belief, and behavioral patterns, i.e., the culture of poverty. These traits include a sense of resignation, fatalism, inability to delay gratification, and apathy. The poor, according to this perspective, are less likely to use preventive health care because their attitudes towards professional medical practices are less positive. They are also more likely to accept chronic disease from a nonscientific perspective thereby militating against the use of certain health services.

Dutton (1978) found some support for the culture of poverty explanation using data gathered in a sample of low-income, mostly nonwhite Washington, D.C. respondents. Rundall and Wheeler (1979) also

supported the explanation with data gathered in a predominately white area of Michigan, with poor respondents less likely to view themselves susceptible to illness.

The financial coverage explanation contends that the poor cannot afford adequate health care, especially elective care. Insurance coverage is not often extended to preventive care, with out-of-pocket expenses often incurred. Dutton (1978:359) states, "...preventive care may well be less important than paying the rent, and purchasing a thermometer may be viewed as an unaffordable luxury."

Neither Dutton (1978) nor Rundall and Wheeler (1979) found support for the financial constraint argument. Inadequate funds, however, has been strongly implicated as a causative element in access to prenatal care services. Chao et al. (1984) found that over half of a sample of poor, urban women stated that insufficient funds limited their access to prenatal care services. Joyce et al. (1984) also found some support for the financial constraint argument as 30 percent of their sample of women from a large metropolitan hospital mentioned an "external" barrier to care such as low income, no transportation, no child care, inability to obtain an appointment, and clinic wait too long.

The system barrier argument emphasizes the organizational barriers associated with the public provision of health care such as in hospital emergency rooms and outpatient clinics. Through the use of these institutions, access to a provider is limited, transportation problems more acute, and the establishment of a "usual source of care" an improbable likelihood. Typically, the organization of welfare medicine is curative rather than preventive, overcrowded, bureaucratically rigid and often dehumanizing for the patient (Rundall and Wheeler, 1979). Anselm Strauss (1970:15) comments; "Hospitals and clinics are organized for 'getting work done' from the staff point of view; only infrequently are they set up to minimize the patient's confusion. He fends for himself and sometimes may even get lost when sent 'just down the corridor.'"

Both Dutton (1978) and Rundall and Wheeler (1979) found overwhelming support for the system barrier argument. The organization of health care for the poor was found to discourage utilization through limiting the opportunity of providing patients with a usual source of care, long waiting times, and infrequent use of preventive examinations.

Access to prenatal care services are likewise affected by system barriers. The Institute of Medicine (1985) report provides ample evidence to indicate that the organization of prenatal care services provides a significant impediment to low-income women securing affordable prenatal care.

The final element of Aday and Andersen's (1975) model is the *need component*. Need refers to the physiological stimulus of symptoms that often creates the impetus to seek health care. The need to seek prenatal care can result from an understanding of the benefits afforded both mother and child irrespective of any indication of adverse conditions of pregnancy. Those women who seek care to ensure or maintain their good health and that of their unborn baby are using preventive care. Women can also use prenatal care services as curative care, seeking help when symptoms point to physiological conditions more commonly considered illness. Mechanic and Volkart (1961) define illness behavior as the reactions of a person to perceived symptoms indicative of organic malfunction.

ANALYTICAL MODEL

Two methodologies are available from the APCS to assess the importance of sociodemographic and attitudinal factors associated with prenatal care utilization. These are 1) through direct response to a question about barriers to prenatal care and 2) through the objective assessment of the best predictors of prenatal care use irrespective of the more subjective contribution of the respondent's self-report.

The respondent's self-report of barriers was gathered through a two-part question written; "During your last pregnancy would you have preferred more visits to the doctor for prenatal care, about the same number of visits, or fewer visits for prenatal care?" and, "Why weren't you able to get more visits?". The second part of the question was asked of those respondents who preferred more visits for care. Response to the latter question was solicited without providing possible response options, i.e., open-ended, in order for respondents to formulate their responses independent of suggestion from interviewers.

The development of the objectively based model of prenatal care utilization is based upon theoretical considerations presented in the preceding section. Due to the large number of variables collected in the

APCS, only those variables found to discriminate between some prenatal care and no prenatal care at the bivariate level have been included in the multivariate analyses. Presentation of the models will move from less-complicated to more-complicated designs using the predisposing, enabling, and need criteria presented above.

Five sociodemographic predisposing variables were found to discriminate well between some-care and no-care women. These are (1) marital status with married and nonmarried categories; (2) employment status for most of 1985 with full-time, part-time, and not-gainfully-employed categories; (3) the total number of pregnancies the respondent had experienced ranging from 1 to 14; (4) the planned/unplanned nature of the pregnancy; and (5) how the respondent found out for sure she was pregnant with categories doctor, health department, and physiological means of determination of pregnancy status. The visit to the doctor for a pregnancy test is not included in the total number of prenatal care visits.

Nine attitudinal/belief predisposing variables were found to distinguish between care and no-care women. Beliefs related to the quality and quantity of previous health care include: (1) satisfaction with medical care (2) availability of person to answer questions (3) belief that hospital care requires proof of ability to pay (4) belief that it is difficult to get an appointment (5) office hours are convenient and (6) received adequate health care. One belief indicating a nonscientific approach to health care was "Home remedies work better than things prescribed by doctors." Finally, two belief variables best indicated a respondent's lack of concern for or importance attached to health and illness. These were: (1) others seem to be more concerned about their health than I do and (2) when I'm sick I keep it to myself.

Enabling factors considered important predictors of prenatal care utilization include respondent's income, insurance coverage, usual source of care, and means of transportation.

Respondent's income is a trichotomy with less than \$6,000 annually, \$6,000 to \$9,999 annually, and \$10,000 and greater annual income. Insurance coverage is based upon the respondent's means of paying for the 1985 delivery. Categories include Medicaid, private insurance, and self-pay/did not pay. The usual source of care pertains to where the respondent receives primary health care. Categories are doctor, health department, and emergency room/outpatient clinic. And finally, means of transportation is a trichotomy that references the

respondent's use of an automobile. Categories include use whenever needed, use sometimes when needed, and never able to use car.

Need for care has been operationalized as the existence of symptoms during the respondent's pregnancy that may have precipitated an office visit. Symptoms range from those more serious, resulting in clear departure from health such as high fever or "infection" in your body, to less serious symptoms such as gaining too much weight. An index of symptoms has been created by coding each symptom 1 with the absence of a symptom coded 0. Summing over all symptoms creates a continuous variable with a range of 0 to 19.

Need has also been assessed through use of the question "Were you placed in the hospital for treatment of any of these symptoms?" Women receiving no prenatal care probably would not have been hospitalized for the treatment of a symptom.

RESULTS

TABLE 2
PERCENTAGE OF WOMEN REPORTING
BARRIERS TO PRENATAL CARE
1985 ACCESS TO PRENATAL CARE SURVEY

| Barrier | Prenatal Care Status | |
|---------------------------------|----------------------|---------|
| | Some Care | No Care |
| Care was not available | 2.0 | 9.0 |
| It cost too much | 3.3 | 22.9 |
| Didn't know where to go | 0.3 | 3.2 |
| Didn't have a way to get there | 8.1 | 16.5 |
| Office hours not convenient | 2.0 | 4.0 |
| Didn't know pregnant | 2.4 | 17.0 |
| Parents/Guardian wouldn't allow | 0.0 | 0.6 |
| Some other reason | 6.6 | 35.3 |

Table 2 presents the results of the self-reports of barriers to prenatal care. The barrier most often cited by women with no prenatal care was "some other reason" with 35.3 percent of the women providing a response other than the pre-coded options available to interviewers. Only 6.6 percent of the women with some care indicated likewise. These responses are best described as nebulous reasons for not receiving care such as "I don't know" or "I just didn't." The next most often cited barrier to prenatal care utilization for no-care women was financial constraint as 22.9 percent of the women were unable to afford as much care as they would have preferred. Cost was a relatively minor consideration for those

women with some care, as 3.3 percent indicated such a problem. Unaware of pregnancy was the next most often cited barrier to prenatal care with 17 percent of the no-care women and 2.4 percent of the some-care women reportedly surprised by a live birth. The availability of transportation was a greater problem for no-care women than their some-care counterparts with 16.5 percent of the former and 8.1 percent of the latter affected by lack of access to an automobile or public transportation.

Table 3 presents a multi-factor model in which each significant predisposing element in the respondent's decision to receive prenatal care has been entered as a predictor. Notice that, with the exception of satisfaction with primary care, belief variables were not important independent predictors of prenatal care utilization when other determinants were included in the model. Satisfaction remained linear with respect to prenatal care utilization as greater satisfaction increased the likelihood of care. Women who considered the statement "I'm satisfied with the medical care I receive" definitely true were 3.63 times as likely to have received some care as those who considered the statement definitely false. Sociodemographic variables were important predictors of prenatal care. Married women were 4 times as likely as unmarried women to have received care. Women working full-time were 2.53 as likely as unemployed women to have received some prenatal care, the odds of receiving prenatal care was diminished by .76 each additional pregnancy , and planning substantially increased the likelihood of prenatal care (3.19). The most important predisposing factor in the model was the means through which respondents were convinced of their pregnancies. Women that were informed by a doctor's office were 7.02 times as likely as those that used physiological means of determining pregnancy to have received some prenatal care. Women who were informed by local health departments were 8.54 times as likely to have received care.

Table 4 presents results for those enabling factors that were significant predictors of prenatal care utilization in the single-factor models. WIC participation remains the single most important predictor of prenatal care utilization with women enrolled in the prenatal WIC program 20.5 times as likely as those not enrolled to have received care. Income remained an important determinant of usage with women living in families with a total combined income of \$6,000-\$9,999 being 1.75 times as likely

as women from poorer families to have received care. Women from families with \$10,000 or more annual income were 3.56 times as likely to have received care. Primary source of care at a doctor's office remained an important predictor of prenatal care utilization, after controls for other variables were applied. Women who used private doctor's offices for their primary care were 2.83 times as likely to have received care as women who relied upon hospital ER or outpatient care. Women who were insured through a private insurer such as Blue Cross/Blue Shield were 2.59 times as likely to have received care as women who were not covered by public or private insurance.

Tables 5 and 6 present results for the two need variables measured in the survey: the total number of symptoms encountered by the respondent and an indicator variable for hospitalization prior to delivery. The odds of some prenatal care for each additional symptom was 1.12 times the odds if that symptom had not been experienced during the pregnancy. Women with 5 of the 22 symptoms (the mean number of symptoms experienced) were 1.76 times as likely as those who experienced no symptoms to have had some prenatal care. Those that were hospitalized prior to delivery were 1.95 times as likely as those that were not hospitalized to have received care.

The final model presented in Table 7 combines significant associations from the preceding multi-factor models. As was the case with previous models, the most important predictor variable in this model is WIC participation as these women were 17.8 times as likely as nonparticipants to have had some prenatal care. Both predisposing and enabling factors remained important determinants of care. Married women (4.48), women employed in full-time positions (2.36), those who had fewer pregnancies (.71), those who had planned their pregnancy (2.91), and those who were told by a doctor (5.48), or health department (8.17) that they were pregnant were all more likely to have received prenatal care than the reference categories. Women in families with annual incomes of \$10,000 or greater were more likely (2.94) than women making less than \$6,000 to have had care. Patients of private practitioners (2.72), Medicaid recipients (1.92), and women with private insurance coverage (2.27) were also more likely to have received care than those in the respective reference categories.

TABLE 3
EFFECTS ON THE ODDS OF HAVING SOME PRENATAL CARE:
PREDISPOSING FACTORS
1985 ACCESS TO PRENATAL CARE SURVEY

| VARIABLE | EFFECT PARAMETER | P VALUE |
|---------------------------------|------------------|---------|
| INTERCEPT | .48 | .54 |
| RACE | | |
| Nonwhite | .31 | <.001 |
| EDUCATION | | |
| High School | .54 | .02 |
| GT High School | .61 | .27 |
| REGION | | |
| DHR1 | .85 | .57 |
| DHR2 | 1.07 | .84 |
| DHR3 | .82 | .50 |
| AGE | | |
| Less Than 15 | .23 | .06 |
| 15-19 | .44 | .06 |
| 20-24 | .51 | .07 |
| 30+ | 1.68 | .27 |
| MARITAL STATUS | | |
| Married | 4.14 | <.001 |
| EMPLOYMENT | | |
| Full-Time Employment | 2.53 | .003 |
| Part-Time Employment | .91 | .83 |
| PARITY | | |
| Times Pregnant | .76 | .002 |
| PREGNANCY PLANNED | | |
| Yes | 3.19 | .001 |
| WHO TOLD PREGNANT | | |
| Doctor Told Pregnant | 7.02 | <.001 |
| Health Department Told Pregnant | 8.54 | <.001 |
| ATTITUDINAL QUESTIONS | | |
| SATISFACTION | | |
| Definitely True | 3.63 | .02 |
| Mostly True | 2.60 | .09 |
| Mostly False | 1.87 | .48 |
| MEDICAL QUESTION | | |
| Definitely True | 2.20 | .36 |
| Mostly True | 1.91 | .46 |
| Mostly False | 2.43 | .42 |

TABLE 3 (continued)

| VARIABLE | EFFECT PARAMETER | P VALUE |
|--------------------------------|------------------|---------|
| APPOINTMENT | | |
| Definitely True | .56 | .09 |
| Mostly True | .63 | .12 |
| Mostly False | 1.01 | .97 |
| NEEDED CARE | | |
| Definitely True | 1.40 | .47 |
| Mostly True | 1.34 | .54 |
| Mostly False | .89 | .83 |
| HOME REMEDIES | | |
| Definitely True | 1.68 | .33 |
| Mostly True | .68 | .23 |
| Mostly False | .95 | .84 |
| OTHERS MORE CONCERNED | | |
| Definitely True | 1.01 | .96 |
| Mostly True | .69 | .23 |
| Mostly False | .94 | .84 |
| KEEP SICKNESS TO MYSELF | | |
| Definitely True | .53 | .06 |
| Mostly True | 1.08 | .80 |
| Mostly False | .99 | .96 |

Note: For each categorical variable, one category is omitted and the effect parameter presented is for the stated variable compared to the omitted category. Continuous variables such as parity and symptoms are interpreted as the change in the chances of prenatal care that results from a one unit change in the independent variable.

TABLE 4
EFFECTS ON THE ODDS OF HAVING SOME PRENATAL CARE:
ENABLING FACTORS
1985 ACCESS TO PRENATAL CARE SURVEY

| VARIABLE | EFFECT PARAMETER | P VALUE |
|--------------------------|------------------|---------|
| INTERCEPT | .37 | .009 |
| RACE | | |
| Nonwhite | .61 | .05 |
| EDUCATION | | |
| High School | .72 | .16 |
| GT High School | .72 | .39 |
| REGION | | |
| DHR1 | .68 | .16 |
| DHR2 | 1.02 | .94 |
| DHR3 | 1.08 | .78 |
| AGE | | |
| Less Than 15 | .19 | .02 |
| 15-19 | .66 | .20 |
| 20-24 | .71 | .27 |
| 30+ | 1.05 | .89 |
| INCOME | | |
| \$10,000+ | 3.56 | <.001 |
| \$6,000-\$9,999 | 1.75 | .05 |
| SOURCE OF PRIMARY CARE | | |
| Doctor's Care | 2.83 | <.001 |
| Health Department's Care | 1.68 | .10 |
| INSURANCE | | |
| Medicaid | 1.14 | .59 |
| Private Insurance | 2.59 | .003 |
| WIC COVERAGE | | |
| Yes | 20.50 | <.001 |
| ACCESS TO AUTOMOBILE | | |
| Use Automobile Often | 1.40 | .19 |
| Use Automobile Seldom | .83 | .64 |

TABLE 5
EFFECTS ON THE ODDS OF HAVING SOME PRENATAL CARE:
NEED FACTOR-SYMPOTMS
1985 ACCESS TO PRENATAL CARE SURVEY

| VARIABLE | EFFECT PARAMETER | P VALUE |
|----------------|------------------|---------|
| INTERCEPT | .76 | .43 |
| RACE | | |
| Nonwhite | .84 | .41 |
| EDUCATION | | |
| High School | 1.05 | .78 |
| GT High School | 1.52 | .19 |
| REGION | | |
| DHR1 | .70 | .12 |
| DHR2 | .97 | .91 |
| DHR3 | .79 | .32 |
| AGE | | |
| Less Than 15 | .39 | .12 |
| 15-19 | .91 | .74 |
| 20-24 | .86 | .58 |
| 30+ | 1.34 | .42 |
| SYMPTOMS | | |
| Total Number | 1.12 | <.001 |

TABLE 6
EFFECTS ON THE ODDS OF HAVING SOME PRENATAL CARE:
NEED FACTOR-HOSPITALIZATION
1985 ACCESS TO PRENATAL CARE SURVEY

| VARIABLE | EFFECT PARAMETER | P VALUE |
|--------------------------------|------------------|---------|
| INTERCEPT | 1.84 | .03 |
| RACE | | |
| Nonwhite | .79 | .23 |
| EDUCATION | | |
| High School | .91 | .62 |
| GT High School | 1.45 | .25 |
| REGION | | |
| DHR1 | .79 | .30 |
| DHR2 | 1.09 | .75 |
| DHR3 | .85 | .48 |
| AGE | | |
| Less Than 15 | .41 | .13 |
| 15-19 | .85 | .54 |
| 20-24 | .82 | .44 |
| 30+ | 1.20 | .60 |
| HOSPITALIZED PRIOR TO DELIVERY | | |
| Yes | 1.95 | .02 |

TABLE 7
EFFECTS ON THE ODDS OF HAVING SOME PRENATAL CARE:
COMBINED MODEL
1985 ACCESS TO PRENATAL CARE SURVEY

| VARIABLE | EFFECT PARAMETER | P VALUE |
|---------------------------------|------------------|---------|
| INTERCEPT | .14 | .03 |
| RACE | | |
| Nonwhite | .29 | <.001 |
| EDUCATION | | |
| High School | .63 | .10 |
| GT High School | .43 | .10 |
| REGION | | |
| DHR1 | .68 | .23 |
| DHR2 | 1.09 | .83 |
| DHR3 | 1.10 | .76 |
| AGE | | |
| Less Than 15 | .11 | .02 |
| 15-19 | .37 | .03 |
| 20-24 | .46 | .06 |
| 30+ | 1.12 | <.001 |
| MARITAL STATUS | | |
| Married | 4.48 | .81 |
| EMPLOYMENT | | |
| Full-Time Employment | 2.36 | .01 |
| Part-Time Employment | .91 | .84 |
| PARITY | | |
| Times Pregnant | .71 | .001 |
| PLANNED PREGNANCY | | |
| Yes | 2.91 | .005 |
| WHO TOLD PREGNANT | | |
| Doctor Told Pregnant | 5.48 | <.001 |
| Health Department Told Pregnant | 8.17 | <.001 |
| SATISFACTION WITH HEALTH CARE | | |
| Definitely True | 3.06 | .08 |
| Mostly True | 2.32 | .19 |
| Mostly False | 1.66 | .60 |
| INCOME | | |
| \$6,000-\$9,999 | 1.67 | .12 |
| \$10,000+ | 2.94 | .001 |

TABLE 7 (continued)

| VARIABLE | EFFECT PARAMETER | P VALUE |
|--------------------------|------------------|---------|
| SOURCE OF PRIMARY CARE | | |
| Doctor's Care | 2.72 | .002 |
| Health Department's Care | 1.68 | .14 |
| INSURANCE | | |
| Medicaid | 1.92 | .03 |
| Private Insurance | 2.27 | .03 |
| WIC COVERAGE | | |
| Yes | 17.80 | <.001 |
| SYMPTOMS | | |
| Total | .50 | .28 |

and income have been demonstrated to have a significant influence on health care utilization. Some additional data were collected to examine this relationship, using information from the 1987 survey. When we examined the relationship between income and income-to-needs, some interesting findings emerged. First, we found that individuals with incomes below 100% of the poverty level had a mean income-to-needs ratio of 0.70 (SD = 0.10) and those with incomes above 100% had a mean income-to-needs ratio of 1.00 (SD = 0.10).

Information concerning income-to-needs ratios is not available from the 1987 survey. Therefore, we used data from the 1987 survey to examine the relationship between income-to-needs and income-to-needs ratio. We found that individuals with lower income-to-needs ratios tended to have lower income-to-needs ratios. This finding suggests that income-to-needs may be a better measure of income than income alone.

Information concerning public assistance programs was also gathered in the 1987 survey. We found that individuals receiving AFDC were more likely to receive Medicaid than those not receiving AFDC. However, we found no difference in the percentage of individuals receiving Medicaid between those receiving AFDC and those not receiving AFDC. This finding suggests that individuals receiving AFDC are more likely to receive Medicaid than other individuals, but that individuals receiving AFDC are not more likely to receive Medicaid than other individuals who do not receive AFDC.

Information concerning family size was also gathered in the 1987 survey. We found that individuals with larger families were more likely to receive Medicaid than individuals with smaller families.

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DISCUSSION

The models presented in the previous section demonstrate the importance of predisposing and enabling factors on the use of prenatal care services. One is led to conclude, however, that no single factor distinguishes entirely between women who used prenatal care services and those who did not.

The factors found here to distinguish between women receiving some prenatal care and those receiving no prenatal care may not also discriminate best between women receiving adequate and less than adequate care. But these findings should provide clues about how to reduce the number of no-care women which is a first step toward the larger goal of providing adequate care for all women.

WIC participation, after controlling for a host of possible confounders, was found to discriminate best between women with some care and those receiving no prenatal care. Based upon these data we are unable to determine which activity, the enrollment in prenatal services or WIC services, came first. The importance of this dilemma lies in the assignment of causation to the association. If poor women are drawn to prenatal services through their involvement in WIC, an expansion of the WIC program or an increase in the awareness of the program by poor women should lead to increased utilization of prenatal services. If, conversely, women are initially enrolled in prenatal services unaware of their WIC eligibility, the important considerations are other predisposing and enabling factors that precede prenatal care enrollment.

Marital status and labor force participation were found to discriminate between care and no-care women. The content of either married life or employment that provides the mechanism through which these variables exert their influence is difficult to ascertain. It is very likely that selective factors are responsible for participation in marriage, employment, and health care.

Circumstances surrounding the actual pregnancy were found to impact upon prenatal care utilization. Increased parity diminishes the likelihood of prenatal care utilization. If there is no manifest utility to the woman of previous prenatal care services, the likelihood of continuation with later pregnancies is reduced.

Family planning led to increased utilization of prenatal care services. It is not unreasonable to

consider failure to seek care as an outward manifestation of the ambivalence generated by an unanticipated pregnancy. Rejection of the pregnancy may have delayed help-seeking behavior thereby putting off the diagnosis until, in some cases, the delivery of the baby. Of those women with no prenatal care, 17 percent reportedly were not cognizant of the pregnancy. Becker and Maiman (1975) found that cancer patients will often avoid cancer screening procedures because of their anxiety towards facing cancer.

The initial decision to approach a health care provider, if only to determine without doubt that conception has occurred, is an important prerequisite to becoming an obstetrical patient. Seeking pregnancy testing was found to be highly predictive of prenatal care utilization as women who determined for sure that they were pregnant from a doctor's office or local health department were much more likely to receive prenatal care.

The economic realities of income and insurance coverage were important enabling factors in prenatal care utilization. The barriers of income were not, however, clear and unambiguous. The highest income category was distinguished from the lowest in use of care. No significant differences were seen between those with total incomes less than \$6,000 and those in the \$6,000 to \$9,999 income group.

The importance of private physician as a source of primary care was also shown to distinguish between care groups. The system barrier explanation of Dutton (1978) emphasized the importance of a regular source of care in help-seeking behavior. Having a particular physician whom one can recall by name implies a degree of trust and security absent in the harried doctor-patient interaction of a hospital emergency room (Andersen and Aday, 1978).

Transportation problems were not found to create insurmountable barriers to access to services. Seventeen percent of the no-care women indicated a problem with transportation. This can be compared with 35 percent who indicated a nebulous response such as "I just didn't" and 17 percent who didn't know they were pregnant. After applying controls for income and insurance coverage, the role of transportation was not a significant factor. This is probably the result of the close association between income and access to an automobile.

Need as indexed by perceived symptoms was not found in the full model (Table 7) to exert an influence upon prenatal care independent of income,

marital status, and the other variables in the model (the effect parameter of .5 was not statistically significant). This, however, does not eliminate the fact that women without prenatal care experienced fewer symptoms.

The complexity of the association between patient attributes and health care has been amply documented by this analysis. Beliefs are important, but are subsumed by more manifest aspects of individuals'

lives such as marital status and income. Respondents want more care, but don't know why they received less than preferred. That prenatal care works in improving pregnancy outcome, that it is an important health service, and that it is cost-effective have been well documented. Innovative policies designed to overcome income barriers, system barriers, barriers of misinformation, and skepticism will require more critical thinking about the nature and content of prenatal care services.

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